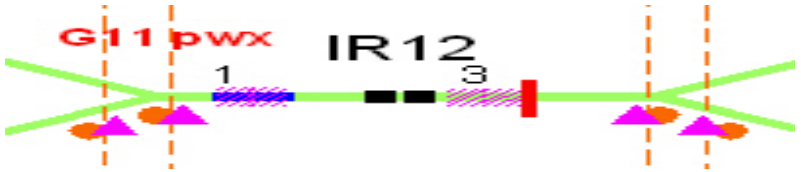
Review of NEG pipes in RHIC

syz, 2 - 2 - 04

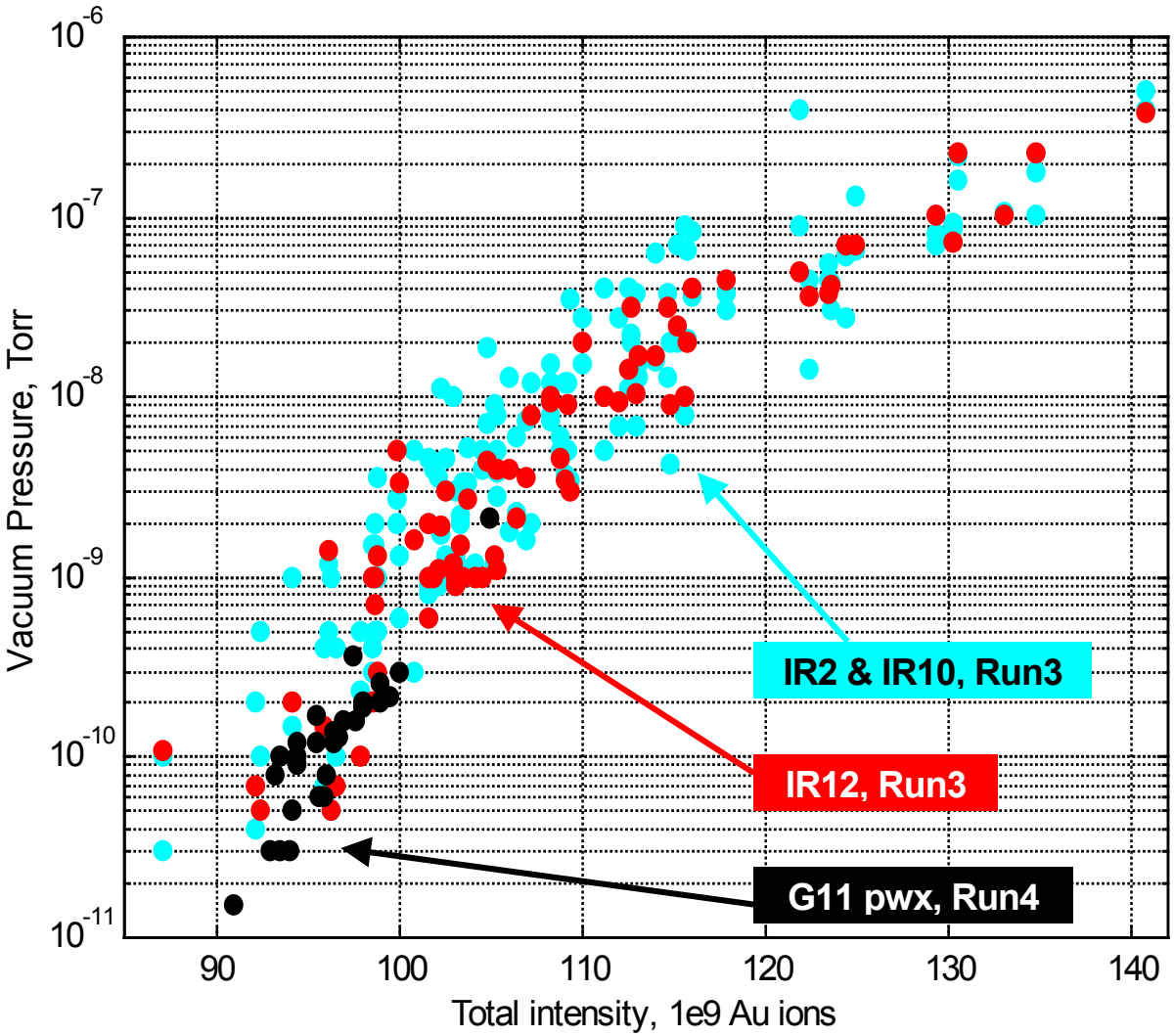
- Data not sufficient in Run4
  - Highest intensity: Blue 60e9 (Bi8) and Yellow 50e9 (Yo4).
  - Only one high intensity study (4209), 60e9 blue, and 35e9 yellow.
- EC induced pressure rise
  - Need high intensity 110bh fill, risk of machine damage.
  - Need beam steering to excite EC at NEG locations.
  - Advantage: pressure rise pattern is known, i.e. pw3.2 is highest, 3.1 and 3.3 lower and more or less symmetrical.
- This study will focus on ion desorption
  - Steering the beam, 1 or 6 bunches?
  - Observe the pressure rise.
- Review of NEG locations: IR12, Yo1, Yi2, Yi10, Bo2, and Bi9.
- Saturation is an issue.
- Activation is another issue: is 250° C, 2 hours baking enough for
  - Pumping?
  - SEY reduction?
  - Electron desorption reduction?
  - Ion desorption reduction?

I. G11



- G11 pwx transition pressure rise is low in Run4.
- In IR12 of Run3, most time G12 pwx was a little higher than G11 pwx.
- Indication not clear yet.
- Pressure without beam:

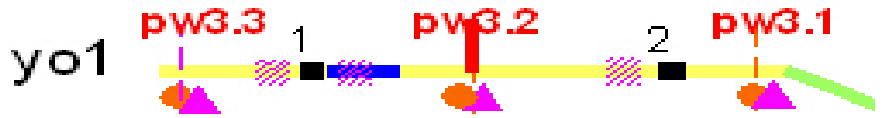
IR12	Run3	Run4	
	Bkd	Bkd	
G11pw1	2e-11	3e-11	Torr
G11pwx	1e-11	1e-11	Torr
G12pwx	5e-11	3e-10	Torr
G12pw1	6e-11	1e-11	Torr

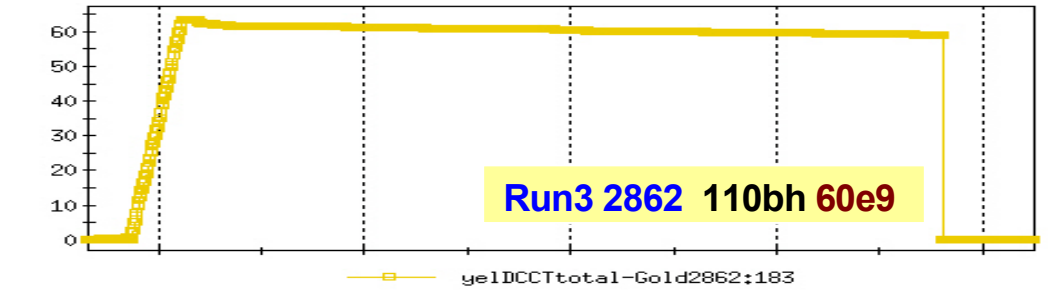


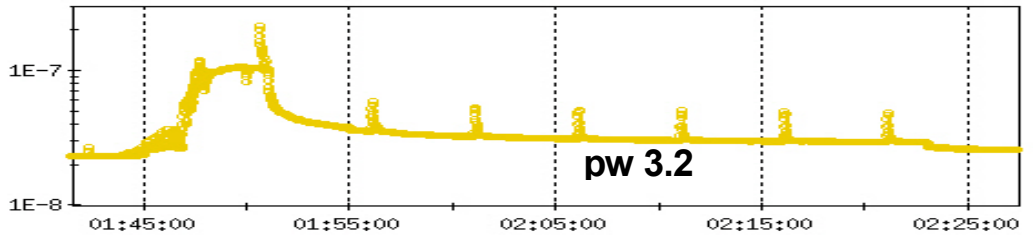
II. Yo1

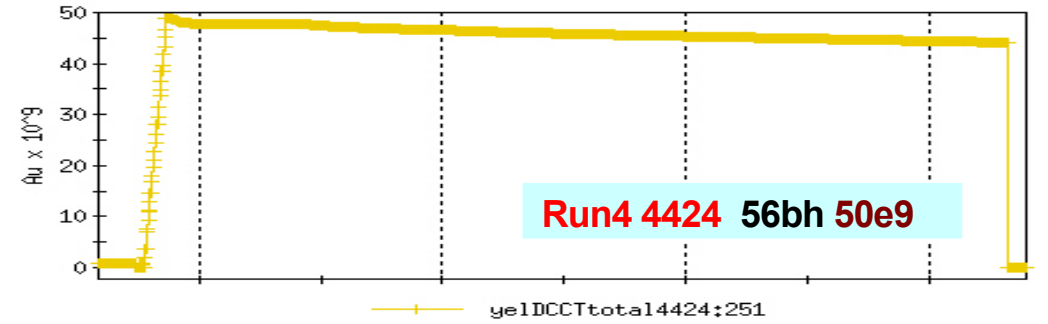
- It seems that Run4 is similar to Run3.
- Run4 pressure rise is with zero threshold.
- Pressure without beam:

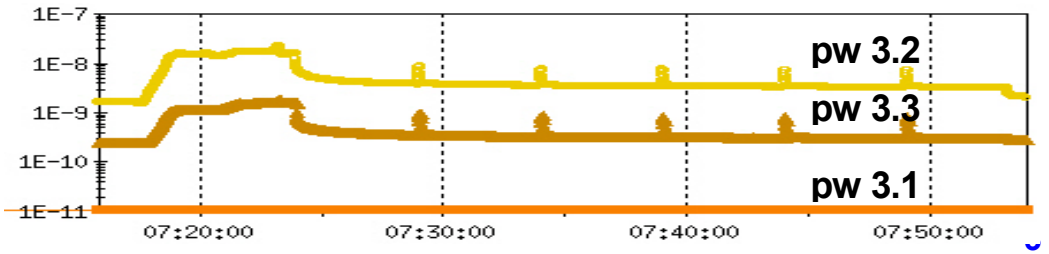
Yo1	Run3	Run4	
	Unbk	Bkd	
pw3.1	2e-9	1e-11	Torr
pw3.2	2e-8	2e-9	Torr
pw3.3	5e-8	2e-10	Torr



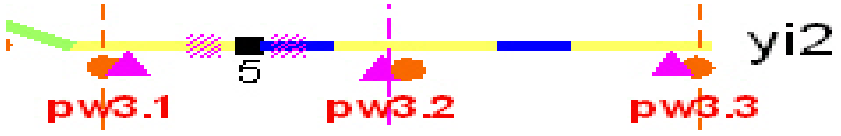






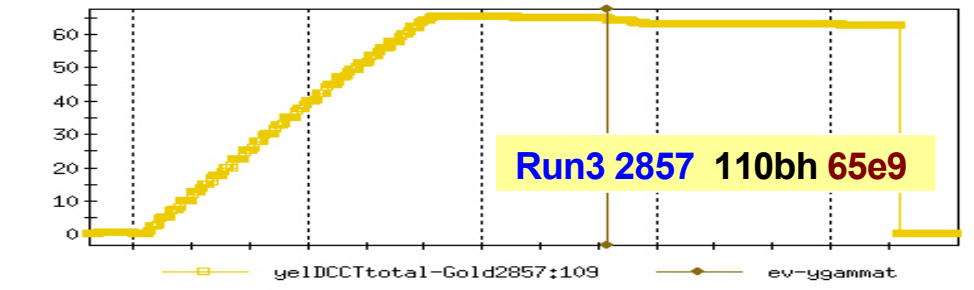


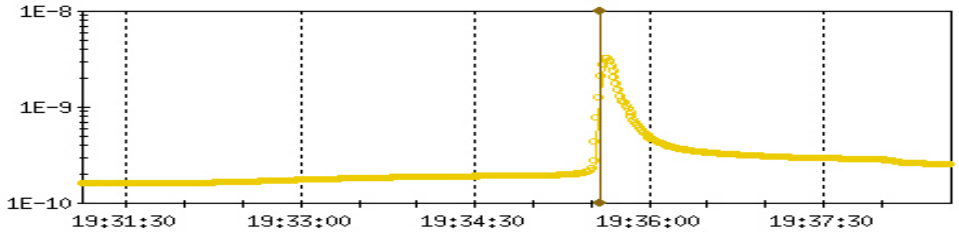
III. Yi2

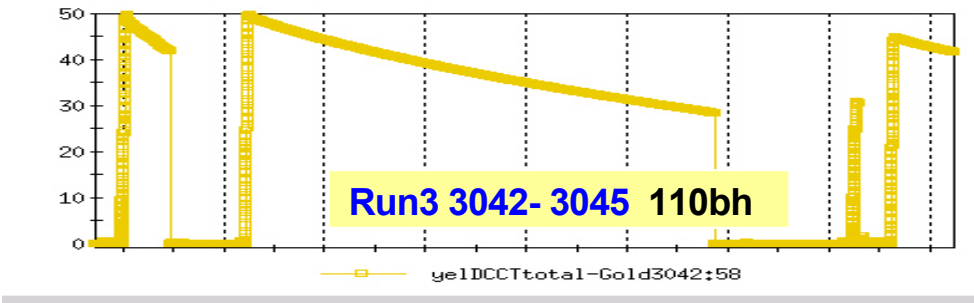


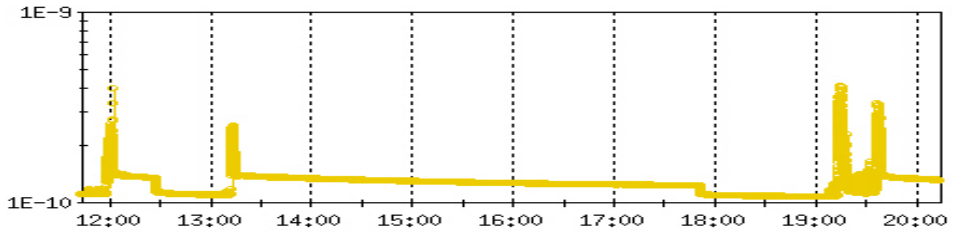
- Yi2 has been event-less in Run4.
- There was something in Run3, but not much.
- Pressure without beam:

Yi2	Run3	Run4	
	Bkd	Bkd	
pw3.1	5e-10	1.5e-11	Torr
pw3.2	1.5e-10	3e-11	Torr
pw3.3	6e-10	1.5e-11	Torr



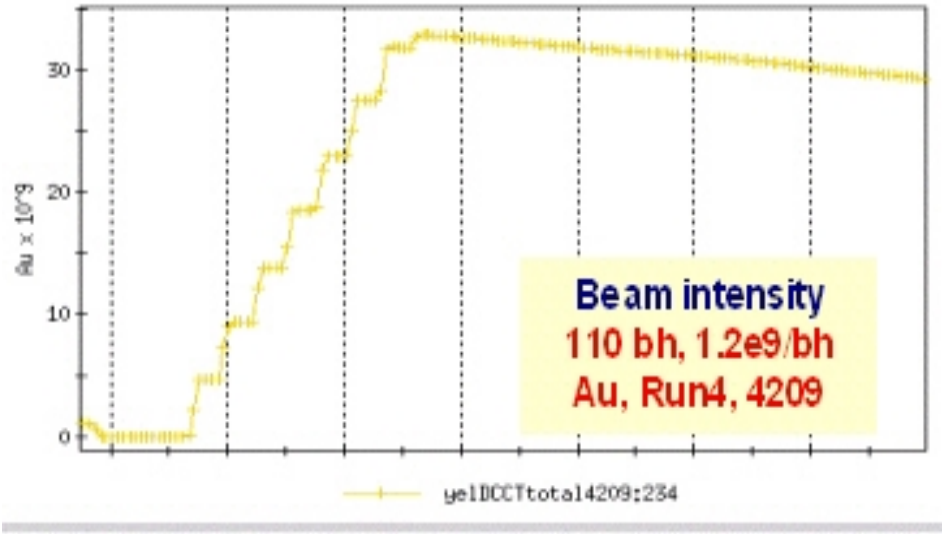


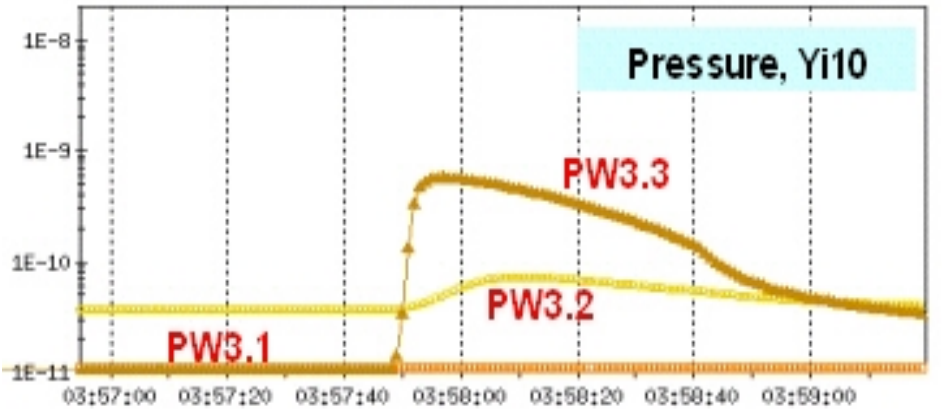




IV. Yi10

- Fill 4209, pressure rise at pw 3.2 is small, - is this an indication that NEG helps for EC type pressure rise?
- Yi10 was event-less in Run4.
- Run3 pressure rise was also not high at the similar intensity. Threshold at 60e9?
- Pressure without beam:



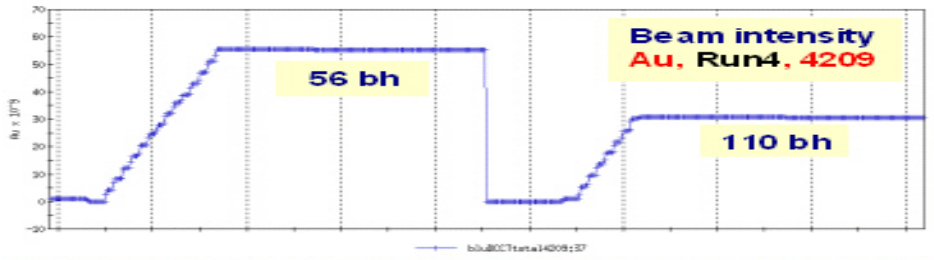


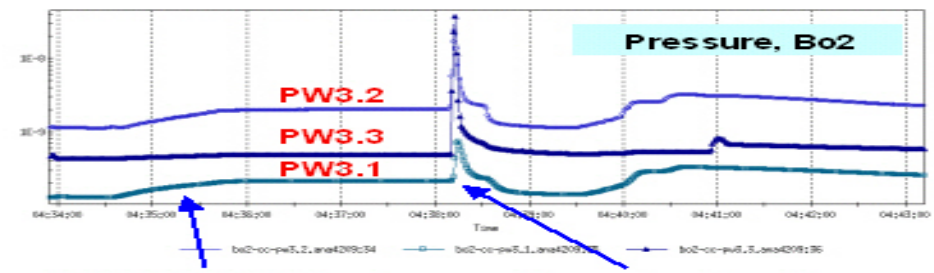
Yi10	Run3	Run4	
	Bkd	Bkd	
pw3.1	1e-11	1e-11	Torr
pw3.2	1e-11	2e-11	Torr
pw3.3	2e-11	1e-11	Torr

V. Bo2

- Fill 4209, pressure rise at pw 3.3 is small, - indication that NEG helps for EC type pressure rise?
- Started from 4390, Jan. 26, pw 3.3 become much worse, pw 3.1 and 3.2 also different.
- IPM-V at pw 3.2, and IPM-H is close to pw 3.3.
- Pressure without beam:

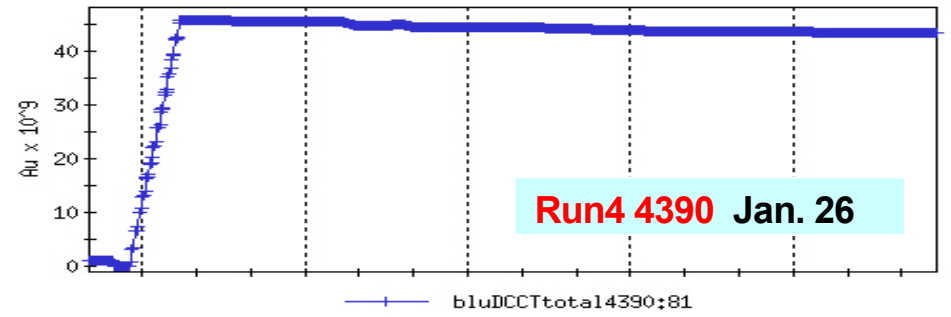
Bo2	Run3	Run4	
	Unbkd	Bkd	
pw3.1	2e-9	8e-11	Torr
pw3.2	4e-9	5e-10	Torr
pw3.3	8e-9	2e-10	Torr

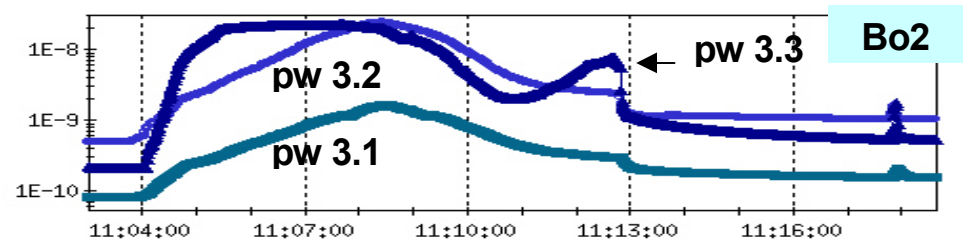




EC? PW3.3 did not come up, 3.2 and 3.1 similar

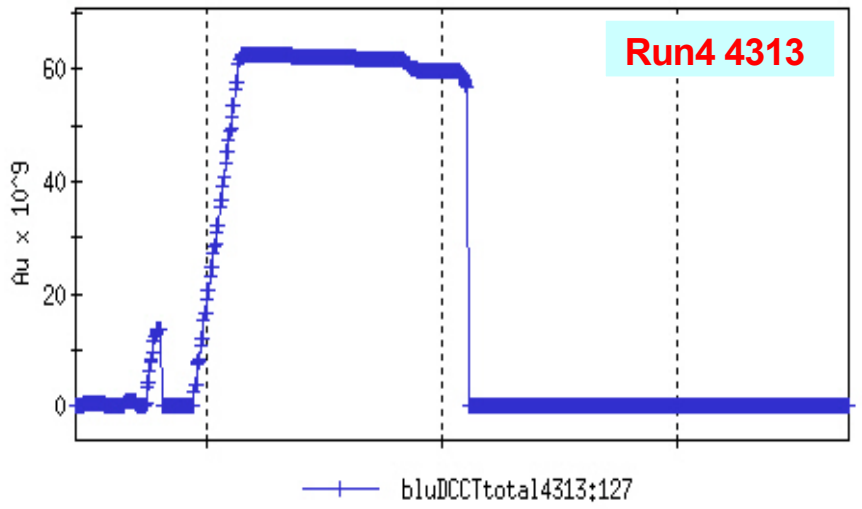
Same incident happend 22 seconds later again, reason is not clear.

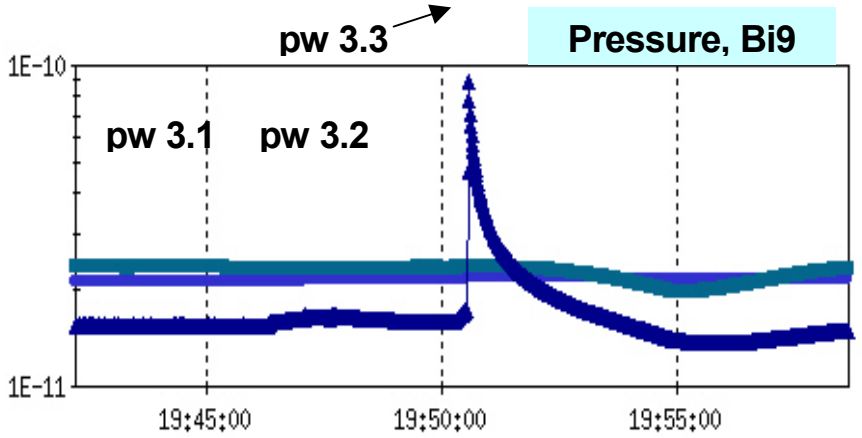




VI. Bi9

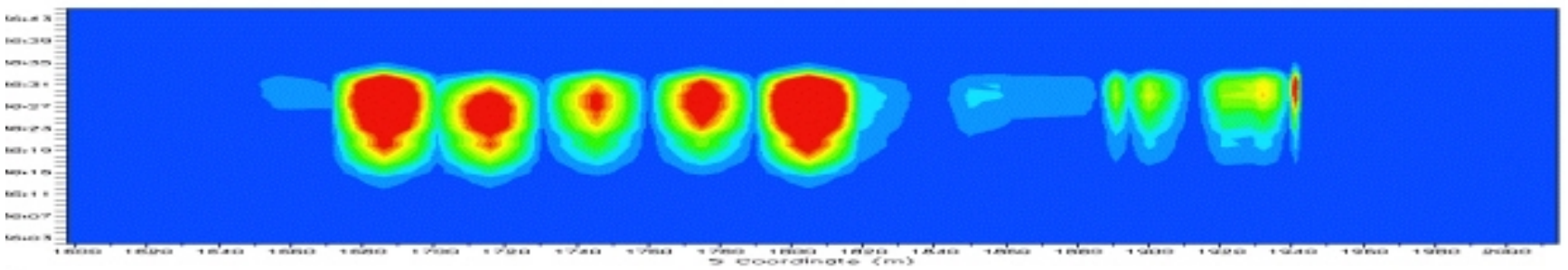
- Threshold in Run3 was about 55e11 deuteron beam.
- In Run4, 4209 at 60e9 ions, no pressure rise was observed.
- Only pressure rise in Run 4 is at the beam loss, such as 4313, at pw 3.3.
- Pressure without beam

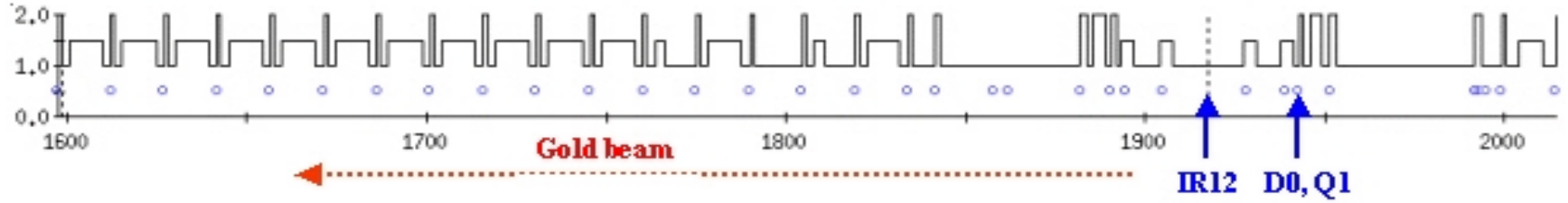


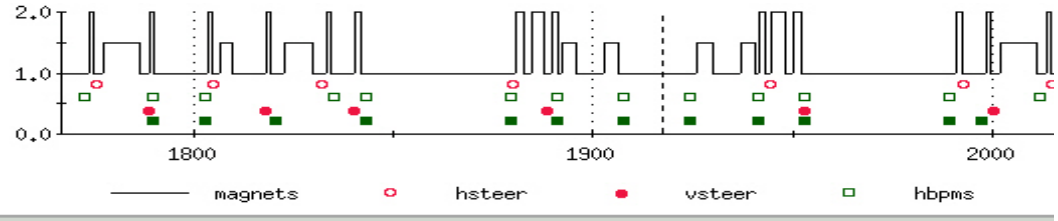


Bi9	Run3	Run4	
	Bkd	Bkd	
pw3.1	3e-11	2e-11	Torr
pw3.2	5e-11	2e-11	Torr
pw3.3	3e-11	1.5e-11	Torr

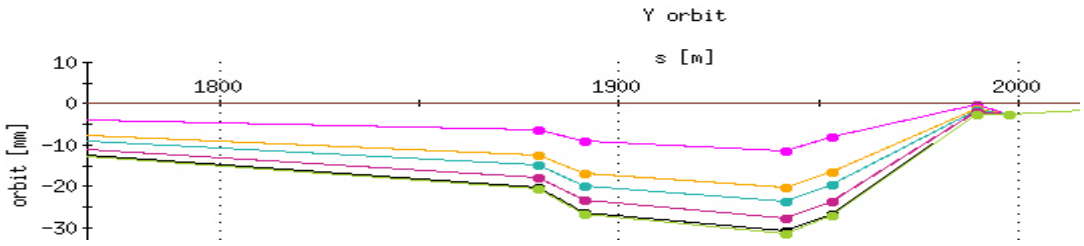
Run3 scraping test



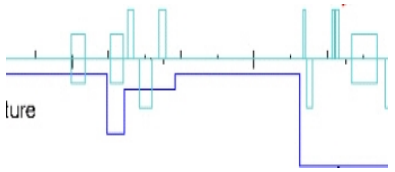




Vertical steering →



Aperture →



Pressure rise at IR12